

Preliminary Case Report on the SARS-CoV-2 Cluster in the UK, France, and Spain

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Almost half of the confirmed COVID-19 cases detected so far in the United Kingdom are part of a large cluster of 13 British nationals who tested positive for SARS-CoV-2 in the UK, Spain, and France. Transmissions among this cluster occurred at a ski resort in France, and originated from a single infected traveller returning from a conference in Singapore where he acquired the virus. At least 21 individuals were exposed to the virus, tested, and quarantined, with 13 of those testing positive between the period of 6th Feb and 15th Feb. Here, all publicly available information about the primarily UK/France cluster is consolidated, providing a complete and accessible summary of the cases and their connections. Notable in this cluster are the number of individuals infected, the apparent absence of any severe illness among those infected, and a case of a 'delayed positive' test during isolation after initially testing negative, at least 7 days after last possible contact.

COVID-19 | SARS-CoV-2 | Contact tracing

In December of 2019, a new virus, later named SARS-CoV-2, was identified among pneumonia patients in Wuhan, a city in the Chinese province of Hubei (1). The disease caused by SARS-CoV-2, COVID-19, can cause serious and fatal respiratory illness, but can also manifest with mild or no symptoms (2–5). One recent study of over 70,000 patients in China suggests that approximately 80% of the cases have been mild (5). Recent studies have indicated that the SARS-CoV-2 virus may be transmissible during the incubation period, before patients display symptoms (6, 7), which has been reported in individual cases outside of China. Though primarily a respiratory illness, at least one study has suggested the virus may also be transmissible through the oral-fecal route (8).

As of 24 February, there are over 77,000 confirmed cases of COVID-19 and over 2,500 deaths due to the virus in China (9), and COVID-19 cases have been detected in 29 countries (9). Outside of China, onward transmission of the virus has been reported in multiple countries, such as Singapore ((10), with data from (11)), Japan (12), South Korea (13), and Germany (7, 14, 15). Of the 2,069 COVID-19 cases outside of China, 84 have been detected while the patient was apparently asymptomatic (9).

Clustering and Contact Tracing. Contact tracing in some of these clusters has provided valuable information about how SARS-CoV-2 can be transmitted, including the serial interval (time between cases), incubation time, recovery time, and the relationship between symptom presentation and transmission possibility. The exposure, timelines, contacts, and symptoms of the first three cases of COVID-19 in France have been described in detail (16).

In Germany, a cluster of 12 cases in Bavaria were traced to a Shanghai-resident business partner who visited the com-

pany Webasto from 19-22 January (7, 14, 15) (English language translation of the excellent *Süddeutsche Zeitung* graphic provided by (17).) The apparent asymptomatic or mildly-symptomatic transmission from the primary case to at least four German individuals in a business setting drew new attention to the transmissibility of the virus (7). From January 28th to February 6th, a further eight people tested positive for SARS-CoV-2, all stemming from these initial infections (14, 15).

In Singapore, a large conference at the end of January sparked worldwide attention when it was found to be source of SARS-CoV-2 infection not only for attendees, but multiple onward contacts. CNA and the BBC have created excellent graphs which link infections acquired at the conference and their onward transmissions (18, 19). The conference, at the Grand Hyatt hotel from 20 to 22 or 23 January, was hosted by a gas analysis company (20, 21). It was attended by 109 delegates, 94 of whom came from outside of Singapore, including one attendee from Wuhan, the city in China at the center of the outbreak (21, 22). The conference was the source of a number of infections: as of 9 Feb, seven attendees had tested positive for the virus in Singapore, Malaysia, South Korea, and the UK (18, 22).

A British individual who attended this conference is thought to be at the center of a cluster of COVID-19 diagnoses across the UK, France, and Spain. As yet, no formal report on the timeline and linking of these connected cases has been produced, but the cluster has none-the-less generated considerable interest.

In an effort to provide as accurate a description of this cluster as possible in the absence of official reports, this paper presents a summary of the timeline and contacts surrounding this transmission cluster, as can best be reconstructed from media reports and limited statements. Many individuals involved have subsequently been identified in media reports, however, in this manuscript identifying information will not be used.

A figure outlining the overall movement and diagnosis dates of the cases forming the cluster is shown in Fig 1. A more detailed figure including all of the the known information presented in this paper can be found in Fig 2. To help more easily keep track of the many patients involved in the text, subscripts are used alongside the letter-identifiers to show the country where they tested positive. For example, case 'A_{UK}' is a man who tested positive in the UK.

EBH conceived the idea, conducted the review of media literature, prepared the manuscript, and created the figures.

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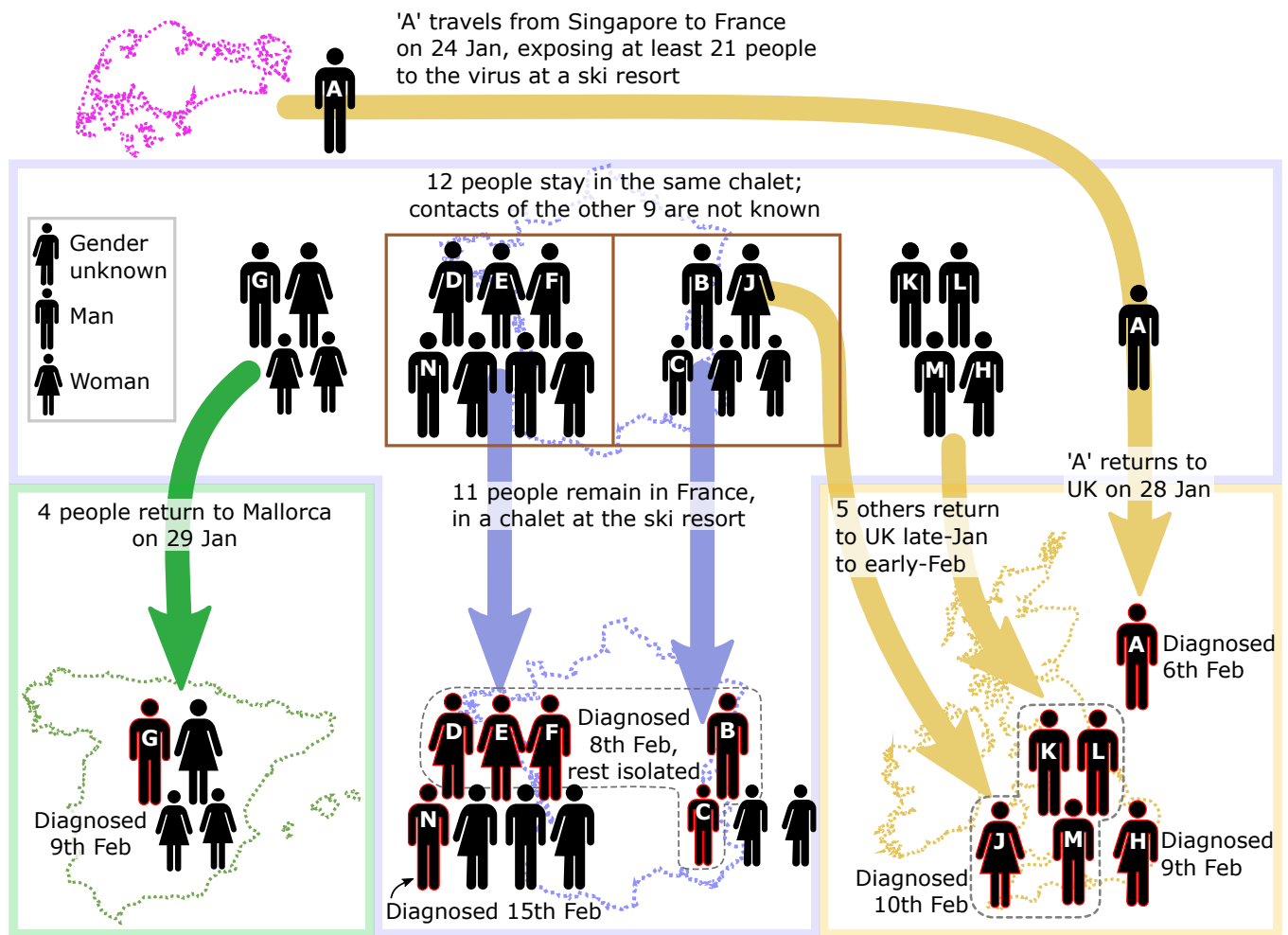


Fig. 1. An overview of the 'UK/France' cluster shows the travel of the twenty-one people known to be involved, and the diagnosis dates of the 13 who eventually tested positive for SARS-CoV-2. Only the dates of when focal case 'A_{UK}' are in France are known definitely, and the overlap of 'A_{UK}' with other cases, and the other cases with each other, is unknown.

Focal Case 'A_{UK}'

'A_{UK}' is a middle-aged British man who attended the conference at the Grand Hyatt hotel in Singapore from 20-22 or 23 January (20, 21), where he is believed to have contracted the virus.

After leaving Singapore, 'A_{UK}' arrived in the French skiing resort of Contamines-Monjoie, in Haute-Savoie, on 24 January, spending a four-day holiday in a chalet before returning to the UK on the 28 January (20, 23).

The chalet reportedly contains (at least) two apartments. Reports of the number of people in the chalet vary between 11 and 12, but this discrepancy can possibly be explained by the travel of one of the owners of the chalet (more below). As far as can be deduced from media reports and statements, all twenty-one people who can be traced back to the ski resort (including 'A_{UK}') are British nationals (20, 24).

One apartment held a British couple ('B_{FR}' and 'J_{UK}') and their three children, including a young boy ('C_{FR}'), who are now resident in France (20, 23, 25, 26). Seven people reportedly stayed in the other apartment (20), but further details about them and their relationship to each other is unclear.

On the 28th Jan (Tues), 'A_{UK}' returned to the UK, on

a flight from Geneva to Gatwick (20, 23). It seems 'A_{UK}' was not symptomatic during the flight (23, 27, 28), with the airline releasing a statement saying, "As the customer was not experiencing any symptoms, the risk to others on board the flight is very low."

'A_{UK}'s exact movements after arriving in Brighton are largely unclear, though two activities have been reported. On the 1 Feb, 'A_{UK}' spent approximately 2 hours, between 7pm and 9pm, in a pub in Hove (29, 30). Two days later, he is reported to have attended a 'runner's yoga class' on Monday, 3rd Feb at the Hove community center (29, 31). However some reports stated that it was another, later case who attended the yoga class, not 'A_{UK}' (32).

Symptoms. Some newspapers reported that 'A_{UK}' experienced symptoms on the 2nd Feb and contacted the NHS (33-35). However, In a statement issued later by 'A_{UK}', he specifically references his lack of symptoms, casting some doubt on these reports (29). In the same statement, 'A_{UK}' also reports he self-isolated, as advised, after calling NHS 111 (29). An earlier call to the NHS would make this conflict with his reported visit to the yoga class on the 3rd (29) - though not if the yoga

class was visited by someone other than 'A_{UK}'.

Diagnosis. It seems that 'A_{UK}' likely contacted NHS 111 on Tuesday or Wednesday (4th or 5th Feb). On their advice, he drove himself to a hospital in Brighton, where he was tested away from the main hospital in isolation, before driving himself home (36, 37) (The Argus live, 11:28am report).

His positive diagnosis was confirmed on the 6th Feb (Thurs) and he was taken to a specialist hospital in London for treatment (37, 38) (The Argus live, 11:28am report). During hospitalization, 'A_{UK}'s symptoms were reported by the NHS strategic incident director as being 'mild,' and after two negative tests for the SARS-CoV-2, 'A_{UK}' was released from hospital on 12 Feb (39).

Cases in France

'A_{UK}'s NHS 111 contact and positive test on the 6th Feb set contact tracing exercises in motion by British health authorities, which identified the current and past occupants and contacts at the Contamines-Monjoie ski resort and chalet (40). It appears that 11 people were residing in the chalet around this time, with 'J_{UK}' (the co-owner of the apartments with her partner 'B_{Fr}') having already departed for the UK. Those remaining included 'B_{Fr}' and his and 'J_{UK}'s three children, among them a young boy ('C_{Fr}'), and 7 visitors in the second apartment.

All eleven individuals were reportedly isolated on the evening of the 7th (Friday), in Lyon, Grenoble, and Saint-Etienne (24, 40). Five of the group then tested positive for SARS-CoV-2 on the 8th (Saturday) (24). The five positive cases included 'B_{Fr}', his young son ('C_{Fr}'), and three other Britons from the second apartment ('D_{Fr}', 'E_{Fr}', and 'F_{Fr}'), and are all reported to have been 'close contacts' with 'A_{UK}' during his stay at the resort (20, 25, 26, 41). From a sample later released on GISAID as originating from Contamines-Monjoie on the 8th Feb, one of the three Britons testing positive from the second apartment was an adult woman (42–44). All five patients were reported not to be in serious condition, though details of their symptoms (or lack thereof) are unclear (20, 24).

Six other Britons present in the chalet at the time tested negative for the virus, but were also isolated on the night of the 7th Feb as a precautionary measure (25, 41, 45, 46). At least one of these was described as a single man hospitalized in Grenoble, but little is otherwise known about those who tested negative (47).

Case in Mallorca

On 9th Feb, a British man ('G_S') living with his family in Mallorca tested positive for the virus, becoming the 2nd case in Spain (48, 49). The family - the man, his wife, and their two daughters - had reportedly been in France from Jan 25-29 and travelled back to Mallorca via Barcelona (50, 51). Officials stated that the man was infected at the ski resort in France, and had contact with 'A_{UK},' but the nature of this contact and/or whether or his family stayed in the chalet identified in French reports is unclear (48, 51). 'G_S' is reported as having light symptoms 24 hours after the trip from France (23).

The whole family were taken into hospital on the 7th and tested, and 'G_S' was diagnosed as positive for SARS-CoV-2 on the 9th Feb (49, 52–54). Tests on the wife and daughters

came back negative both on the 9th and 11th Feb (49, 53, 55). 'G_S's symptoms were initially described as 'light' by the director of the Spanish Ministry's of Health's Center for Health Coordination and Emergencies (56), and he reportedly showed no symptoms on the 10th Feb (57, 58).

A young boy who had close contact with the man was admitted to hospital on 10th Feb and tested for coronavirus (57), but he tested negative on 11th Feb (55).

On 13th Feb, it was announced that a sample of the man, taken on the 12th, came back negative, after previous tests taken on the 8th and 11th were positive (59). A further test released the 14th Feb was also negative for the virus, and 'G_S' was discharged from hospital (54).

Forth UK Case

The fourth case of SARS-CoV-2 in the UK ('H_{UK}') was confirmed on Sunday, 9th Feb. The individual was described by Chief Medical Officer Professor Chris Whitty as "A known contact of a previously confirmed UK case," and the infection was transmitted in France (60). French health officials confirmed that the case was linked to "a stay in the apartment in Les Contamines-Montjoie" (23). The patient was taken to the Royal Free hospital in London for isolation and treatment, but nothing else is known about the patient or the case (23).

Four more UK cases

On the 10th February (Monday), four more cases of SARS-CoV-2 (the 5th - 8th cases) were announced in the UK (61), in three men and one woman ('J_{UK}', 'K_{UK}', 'L_{UK}', and 'M_{UK}') (62). Two members of the group were identified as being doctors ('J_{UK}' and 'K_{UK}') (63, 64). The group of four are described as staying 'at the French resort at the same time [as 'A_{UK}'],' but whether this was in the same chalet, as reported in some articles (63, 65), or what other contact took place between these four, 'A_{UK},' and the residents in the chalet on 7th Feb, is unclear (64). All four were transferred to specialist care at two hospitals in London (61), though the exact date of isolation, testing, or transfer is unknown.

The woman ('J_{UK}') is a locum doctor who was a partner at a Brighton-area medical center until June 2019 (35, 64–66), before she and her family (partner 'B_{Fr}', from the cases diagnosed in France, and 3 children) relocated to France. 'J_{UK}' and 'B_{Fr}' own the chalet in Contamines-Monjoie which was visited by 'A_{UK}' and where some of the patients forming this cluster stayed (66).

It seems 'J_{UK}' was present in the chalet during at least part of the larger gathering of Britons, but returned to the UK prior to the isolation of the remaining 11 people in the chalet on the 7th Feb, possibly explaining why reporting discrepancies exist for the number of people in the chalet (11 or 12). 'J_{UK}' reportedly returned to the UK to work an 'administration shift' at a branch of the medical center where she previously worked, during which she did not see any patients (64–67).

The three men ('K_{UK}', 'L_{UK}', 'M_{UK}') diagnosed on 10th Feb were also present on the skiing trip to France and are reported to have been infected during this trip (62). One of these men ('K_{UK}') was identified as an A&E doctor working at a local hospital, who reportedly saw a small number of patients over two days, on the 4th and 5th of February (Tuesday and Wednesday) (64, 67, 68).

Two of the four people diagnosed on the 10th Feb reportedly travelled back to the UK from Geneva to Gatwick on Jan 31st and Feb 3rd (35), though no further information is available as to which two these may be, or how and when the other cases returned to the UK.

Closures

As a result of the cluster of SARS-CoV-2 diagnoses in the Brighton area, a number of locations closed, or had staff self-isolating, for varying lengths of time. A few are highlighted below, but this list is not exhaustive, as self-isolations and closures were difficult to compile methodically. In addition to those listed below, a number of schools in the UK and France closed or advised students that they could stay home, due to other students self-isolating.

Pub and Yoga Studio. The pub visited by ‘A_{UK}’ on the evening of the 1st Feb, did not close, but reported that five staff members were self-isolating as a precaution (69). The Hove community center where ‘A_{UK}’ or another person later diagnosed with the virus attended a runner’s yoga class on the 3rd Feb was closed on the 10th, and reportedly remained closed until the 17th due to ‘staffing shortages’ (37, 65, 70) (Argus Live, 3:58pm post). Whether the center did re-open as planned could not be confirmed. Additionally, a Hove community center staff member who attended or taught the yoga class was told to self-isolate (31, 65, 71).

Clinics and Clinical Staff. As the two diagnosed GPs had spent time at their places of work before being isolated and diagnosed, a number of medical centers in the area were closed for varying lengths of time. Both branches of the Brighton-area medical center where ‘J_{UK}’ previously worked and reportedly worked an admin shift the week before were closed on the 10th of February, later reopening on the 12th (37, 63–65, 72) (The Argus Live, 10:44am post). Further, 30 doctors in the Brighton area were reportedly self-isolating on the 18th Feb after having contact with a GP who tested positive (73), though which GP this might refer to is unclear.

On the 6th Feb (Thursday), one person later diagnosed with SARS-CoV-2 attended a Clinical Commissioning Group meeting at the Brighton council headquarters (74). As this is the date ‘A_{UK}’ was diagnosed, the individual was presumably the fourth UK case (‘H_{UK}’) or one of the cases diagnosed on the 10th (‘J_{UK}’, ‘K_{UK}’, ‘L_{UK}’, ‘M_{UK}’), and is reportedly one of the two GPs, ‘J_{UK}’ or ‘K_{UK}’ (73).

Nursing Home. After one of the two GPs who tested positive on 10th Feb reportedly visited a patient there, a nursing home in Brighton closed to visitors on 11 Feb (Tuesday) (67). No patients were reported to be unwell, and the closure was described as a precaution (37) (Argus Live, 11:53am post). The nursing home reopened on 12 Feb (75) (16.38 post).

Further isolations. On the 7th Feb, a student from Portslade Aldridge Community Academy was advised to self-isolate after having contact with ‘A_{UK}’ (20, 69).

A toddler and his mother began self-isolating on an unknown date after the boy was treated at the local hospital on 2nd Feb by the GP (‘K_{UK}’) who later tested positive for the virus (76). He was taken in for a minor injury, but after the visit developed ‘a fever and bad cold-like symptoms,’ as

reported on the 14th Feb (76). On 18th Feb, the local press reported that his test was negative, though the exact test date is unknown (73).

9th UK Case

On the 12th Feb, a Chinese national tested positive for the SARS-CoV-2 virus, becoming the 9th UK case (77). This case is entirely **unrelated** to the cluster described here, but as the total number of positive tests and people hospitalized is referenced in statements and in the press after this, the 9th case must be mentioned to avoid confusion in the numbers. The woman reportedly contracted the virus in China, and self-reported at a local hospital A&E on 9th Feb (78). After being assessed in an isolated area, she was taken home to self-isolate by ambulance, and was confirmed positive for the virus on 12th Feb (Wednesday) (77, 78). She was then taken to a specialist London hospital that evening for treatment (78).

Additional Case in France

On the 15th Feb, an additional British man tested positive for the SARS-CoV-2 virus in France (79) (‘N_{FR}’). His health was reported as not causing concern (46). The man was one of the six who initially tested negative for the virus on the 8th Feb, but were kept in hospital isolation (79, 80).

All eleven of the individuals staying at the chalet were placed into isolation on the night of the 7th Feb (79, 80), and French officials confirmed that (translation) “the patient has remained in strict isolation in the referral hospital in Lyon since last Saturday” (46) and (translation) “since his arrival at the hospital, he has been regularly evaluated and tested” (81).

The patient’s last possible date of infection was therefore the 7th Feb - though he could have been infected earlier - meaning that there were at least 7 days where the patient tested negative before testing positive on the 15th Feb. This also implies that this man is unlikely to have been directly infected by ‘A_{UK}’ - though this is not impossible. As ‘A_{UK}’ left France on the 28th January, this would put 15 days between contact and the positive test.

Release of Patients

On the 17th Feb, NHS England and NHS Improvement stated that of the nine cases diagnosed in the UK, eight had been released from hospital after two negative tests (82, 83). The remaining hospitalized case is most likely the 9th case, diagnosed on 12 Feb, meaning that all of those diagnosed and associated with ‘A_{UK}’ and the ‘ski chalet’ had been released.

The British family in France (consisting of ‘B_{FR}’ and his three children, including ‘C_{FR}’), hospitalised in Grenoble, were released on 18th Feb. (47, 84, 85). The fifth patient who had been held there, described elsewhere as a ‘single man’ who tested negative on the 8th Feb (47), was also released (86). As of the 18th Feb, four cases were reported to remain hospitalised in France: three in Lyon and one in Saint-Etienne (85). It is unclear whether the patients who remain hospitalised are those who tested positive or negative on the 8th February, though it presumably includes the patient diagnosed on the 15th. Details of which patients have already been released, and when this occurred, are also unclear.

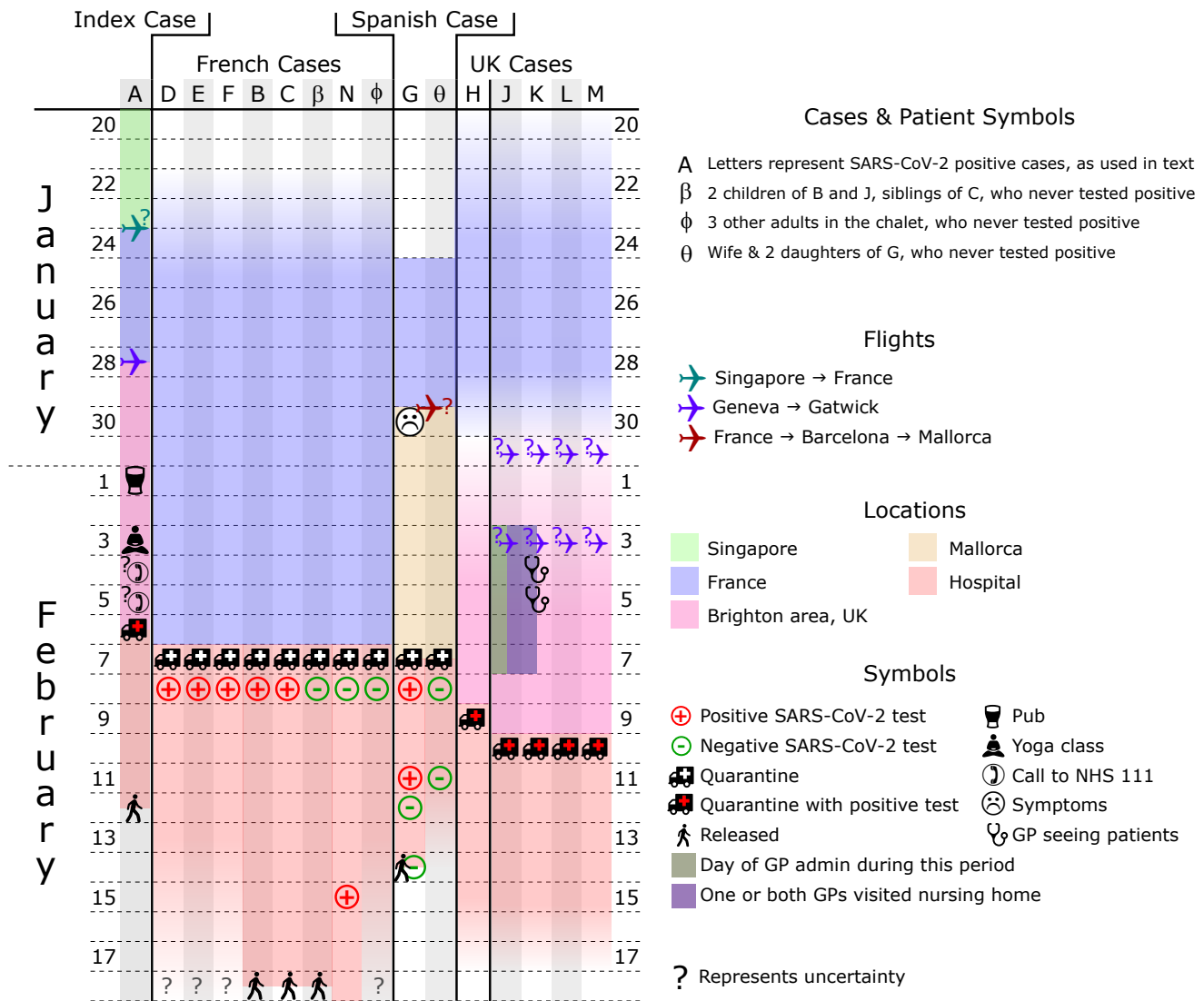


Fig. 2. This detailed figure includes almost all information that is provided in the text, including travel and quarantine time, diagnoses and additional tests (if available), release date, and other important activities. Greek letters are used to represent multiple people who never tested positive for SARS-CoV-2. Question marks show uncertainty about when or for whom an event occurred. Shading in the location colours conveys uncertainty about when individuals travelled, when they were present in a location, and by extension, when they overlapped with other individuals.

Conclusion

In total, twenty-one people are known to be associated with the cluster of COVID-19 cases transmitted in France and later detected in France, the UK, and Spain. Including index case 'A_{UK},' thirteen of those people tested positive for SARS-CoV-2. Encouragingly, none of the individuals involved have suffered from any form of severe symptoms; some seem to have perhaps had entirely asymptomatic infections. However, the fact that an asymptomatic or nearly asymptomatic index case could have transmitted the infection to so many people raises concerns about the feasibility of containing the spread of SARS-CoV-2.

The lack of detail on the type and duration of contact the individuals at the ski resort in Contamines-Monjoie is unfortunate. While it seems some individuals (those isolated in France on the 7th Feb, and presumably 'J_{UK}') were sharing apartments within the chalet, for most of the cases detected

outside of France, including 'A_{UK},' the spatial and temporal overlap with other cases, or with 'A_{UK},' is unknown.

The delayed positive test from 'N_{FR}' is worth mentioning again. As 'N_{FR}' was isolated on the night of the 7th Feb, along with all the other chalet residents, there is uncommon certainty that 'N_{FR}' had no further contacts after this point. 'N_{FR}' was also closely monitored and regularly tested, presumably continuing to test negative until the 15th Feb, when positive test was announced. The last possible contact with another person who tested positive for the SARS-CoV-2 virus was on 7th Feb, though 'N_{FR}' could have become infected some days before that - even earlier if they were infected directly from 'A_{UK},' who departed France on the 28th Jan. This thus is a very reliable case, due to the isolation, showing the incubation period can be at least 7 days, and possibly longer.

Cluster and case descriptions like this one can provide valuable insights into what kinds and duration of contact seem

to be conducive to the spread of SARS-COV-2. They also outline possible ranges of symptoms, and may be a source of information on whether symptoms are necessary for the virus to spread, and what kind of symptoms may facilitate transmission. Finally, thorough case and cluster descriptions are valuable as a pool of more accessible information for other scientists to use to include in larger studies and investigations, providing condensed, usable data that can more easily be understood and built upon.

Updated Figure Availability

Up-to-date versions of Fig. 1 and Fig. 2 can be found online at github.com/emmahodcroft/British-COVID19-Cluster. If new information becomes available, these figures will be updated accordingly. Older versions can be viewed thanks to Github's versioning.

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